

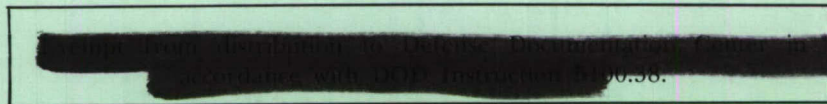
Information on Over-the-Horizon Radar

Part VI

[Unclassified Title]

LTCOL JOHN J. BRUNELLY, JR., Hqs. AFSC
F. MALCOLM GAGER, NRL
MAJ PATRICK G. LONG, Hqs. USAF
PHILIP SHARKI, RADC

13 August 1965



U.S. NAVAL RESEARCH LABORATORY
Washington, D.C.

20070918669

APPROVED FOR PUBLIC
RELEASE - DISTRIBUTION
UNLIMITED

SECRET

[REDACTED]

LAND EXPLORATION DATA FOR AN/FPS-95

[REDACTED]

LTCOL John J. Brunelly, Jr., Hqs. AFSC
F. Malcolm Gager, NRL
MAJ Patrick G. Long, Hqs. USAF
Philip Sharki, RADC

15 August 1965

[REDACTED]

Exempt from Distribution to Defense
Documentation Center in Accordance
with DOD Instruction 5100.38

[REDACTED]

[REDACTED]

SECRET

CONTENT

This report contains proposed study information and indirect mission details for AN/FPS-95.

PROBLEM STATUS

This report is associated with the report of the Survey Team CHUSMMAT May 1965, and the various trip reports made by the members of the team to their respective offices.

AUTHORIZATION

USAF MIPR (30-602) 64-3412 to the
Naval Research Laboratory,
dated 26 March 1964
NRL Problem 53R02-42

SECRET

TABLE OF CONTENTS

GENERAL INTRODUCTION-----	Page 1
SECTION I CIVIL ENGINEERING DATA-----	Page 2
(A) Land Area "B"	
General Location, Directions to Area "B"	
Terrain and Topography-----	Page 2
Specific Distance Measurements, Obstructions and Nearby Villages-----	Page 4
Access to Area "B", Site Preparation-----	Page 6
Right of Way Mineral Leases and Ownership-----	Page 8
(B) Land Area "D"	
General Location, Directions to Area, Terrain and Topography-----	Page 8-10
Specific Distance Measurements, Obstructions-----	Page 12
Nearby Villages, Access to Area "D", Site Preparation-----	Page 13
Right of Way, Mineral Leases and Ownership-----	Page 14
SECTION II, LOGISTICS DATA-----	Page 15
(A) Summary of Findings	
USAF Supply Depots, Construction	
Material Availability	
Detailed Factual Data-----	Page 16
Cost of Materials	
Transportation-----	Page 17
Contractors, Local Labor Costs, Living Conditions-----	Page 18
Communications, Environmental Data, Mechanical and Construction Equipment-----	Page 19
Water, Security, Banking-----	Page 20
Lodging and Subsistence-----	Page 21
Civil Engineering Information Brochure, Passports, Visas, Personal Conduct-----	Page 22

SECTION III, RADIO COMMUNICATIONS, RADAR, AND RADIO INTERFERENCE DATA-----	Page 23
Introduction, Sources of Information, General Information-----	Page 23
Specific Information-----	Page 24
Communications Data-----	Page 24
Radar Data-----	Page 27
Broadcasting Data-----	Page 28
SECTION IV, WEATHER, MAPS AND MISCELLANEOUS DATA	
Maps-----	Page 29
486L Weather Survey, Frost Line, Dust Storms and Civilian Air Travel-----	Page 30
References-----	Page 33

LIST OF FIGURES

Fig. 1 Elementary Coordinate Map of Site "B"-----	Page 3
Fig. 2 Panoramic Photo View of Focal Point "B ₁ " of Site "B"-----	Page 5
Fig. 3 Panoramic Phot View of Focal Point "B ₂ " of Site "B"-----	Page 7
Fig. 4 Elementary Coordinate Map of Site "D" and Environs-----	Page 9
Fig. 5 Panoramic Photo View From a Focal Point, Site "D"----	Page 11
Fig. 6 Wind Speed, Diyarbakir, Turkey-----	Page 32

LAND EXPLORATION DATA FOR AN/FPS-95

INTRODUCTION

The data contained herein were collected as part of a general area exploration survey for the proposed installation of the AN/FPS-95 radar near Diyarbakir, Turkey.

The data are not intended to be in sufficient detail to make final the specific site selection, but they should provide an excellent starting point for the detailed survey which is required prior to ultimate site selection.

The information presented was obtained by personal observations and measurements of the Survey Team, interviews with personnel from CHJUSMMAT and TUSLOG, Ankara, Turkey and discussions with military personnel of TUSLOG DET 171, Diyarbakir, Turkey.

For the reader's information, the subject data were obtained between 30 April and 5 May 1965 by the joint U.S./Turkish land exploration team. The team composition was:

MAJ Patrick G. Long, Hq. USAF (team chief)
LTCOL John Brunelly, Jr., Hq. AFSC
Mr. F. Malcolm Gager, Naval Research Laboratory
Mr. Philip Sharki, Rome Air Development Center
COL Salahatten Yazgan, Turkish General Staff (TAF)
MAJ Luftu Ergin (TAF)
MAJ Gurcan Mete, Turkish Army (Intelligence)
Mr. M. Ipek, Turkish Civilian, Diyarbakir Province, (land
title expert)
LTCOL H. Goodwin, AFSC/SATAF-T (part time, Site B)
CAPT G. Maneri, AFSC/SATAF-T
Mr. Nicholas Geannakakus, Hq. TUSLOG (part time, Site B)

It should be mentioned that Mr. Ipek, Mr. Geannakakus and one member from AFSC/SATAF-T were part-time participants as noted.

For purposes of expediting the effort, all team members collected data of any category wherever possible. However, for purposes of responsibility, the information was divided into four areas. LTCOL Brunelly was responsible for the documentation material of Section I, Civil Engineering Data, Mr. Philip Sharki for documenting the Logistic Support Data, Section II, Mr. F. Malcolm Gager for the Electrical Communications, Radar and RFI Data, Section III and MAJ P. Long Weather, Maps and Miscellaneous Data, Section IV. This report is a minimum of narrative mixed with outline type presentation, but it is believed this approach is adequate for the intended user. NRL edited this material and omissions and errors are their responsibility.

SECTION I

CIVIL ENGINEERING DATA

INTRODUCTION

As a result of an aerial survey with a Turkish Air Force aircraft, map reading and ground observations, the site exploration team investigated four main areas. Of the four, two of the general areas have the potential for AN/FPS-95 locations. These two general areas will be referred to as "B" and "D". This designation keeps this report consistent with other documents created by the Survey Team, even though the latter documents are not available to the reader. The data which follow contain the references as well as other identifying features on the location of the two areas.

(A) LAND AREA "B"

1. General Location

Area "B" is essentially due west of Det. 171 and it is bounded by grid coordinates 70-75 and 92-97 on Turkish secret map, Diyarbakir M43bl. For identification purposes, when traveling west on Highway 6 from Det. 171, the site area lies between hill Kesilik T (91.5 x 73.6 M43bl) and highway bridge (90.7 x 72.2 M43bl). The coordinates of established land marks (trig points) are Kucuk T (94.8 x 73, elevation 1017 meters) and another point (93.4 x 71.2, elevation 1034 meters). A rough sketch of the area on secret coordinates (containing land marks and other data) is depicted by Figure 1.

2. Directions to Area "B"

At the main gate of TUSLOG, Det. 171, turn right on Highway 6, proceed along said highway west for approximately 12 miles and park vehicles in parking area just across highway bridge (90.6 x 71.8, Turkish map Diyarbakir M43bl). From this point proceed on foot due north on grid 72 for approximately 2 km to a hill at coordinates 92.4 x 72, designated "B₁", Fig. 1. One possible site lies forward on this hill. The second possible site in this area lies east and forward on this hill at approximately 93.6 x 73 (Turkish maps) and it is designated "B₂", Fig. 1.

3. Terrain and Topography

The location of focal point (92.2 x 72) and that for (93.6 x 73) with respect to Area "B" is shown by Figure 1. In general, the terrain slopes to the north, northeast and northwest. From map reading exercises the slope appears, to a degree, to satisfy the requirements of AN/FPS-95. However, actual survey measurements of the area are necessary to technically ascertain the suitability of this area for slope requirements and land preparation necessary for successful use. Fences are nonexistent.

SECRET

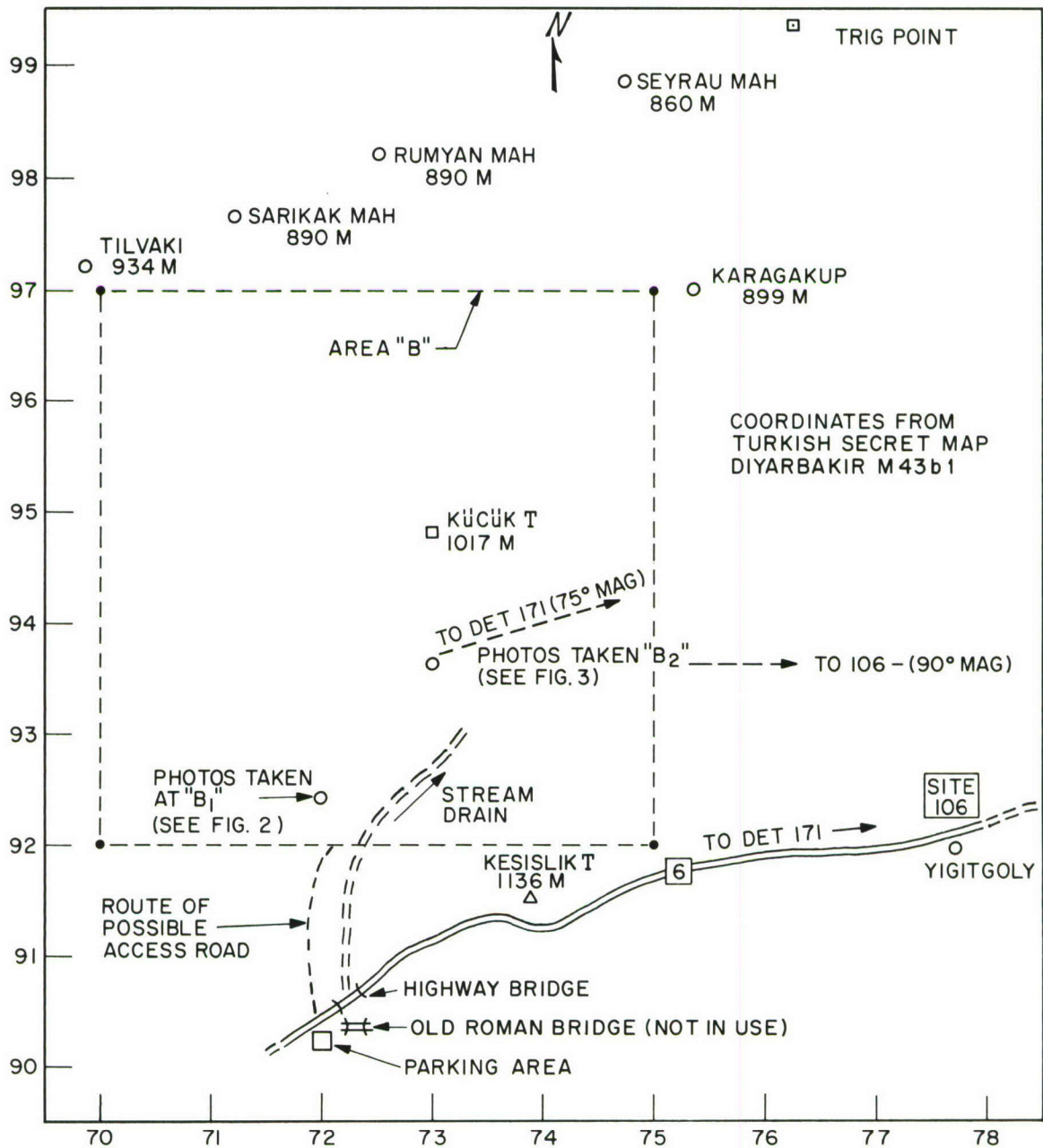


Figure 1 - Elementary Coordinate Map of Site "B"

SECRET

It is reported that there are "floating boulders" in this area from depths of four to six feet. Consequently only a small portion of the rock structure is observed on the surface. The "floating boulder" condition requires building and structure foundations designed specifically to handle the condition. Test borings in the area would be required.

During the rainy season the vegetation in the area is green grass (no trees or shrubs) which is slightly grazed by local and nomadic tribe herds. No interfering cultivation was observed and the only improvements are those shown by Figure 2 (a panoramic from site "B₁") which consist of crude stone corrals which show no extensive use.

No drainage problems exist. Mr. Ipek (Turkish civilian) stated that ravines could be filled so long as no dam was made to withhold the water.

4. Specific Distance Measurements

(a) From area "B" to Det. 171

- (1) By road (Highway 6), 12 miles to highway bridge
- (2) Shortest distance 7-9 km approx.

(b) From area "B" to site 106

- (1) Shortest distance 4.6 km approx.

(c) From area "B" to nearest road

- (1) Shortest distance 2.65 km
- (2) Estimate for access road, 5 km length

5. Obstructions

Other than surface rock and some small ravines, there are no specific obstructions in the area. It was noted that line of sight facilities for communication with Det. 171 (or site 106) are available from potential sites within the area.

6. Nearby Villages

Native villages, designated by coordinates from Turkish secret maps are considered for reference only. Their names, coordinates, and approximate distances in km from Kucuk T are:

Karagakup 97 x 75.3 (M43b1), 4 km,
Seyrau, 99 x 74.6 (M43b1), 5.5 km,
Rumyan, 98.2 x 72.6 (M43b1), 4.5 km,

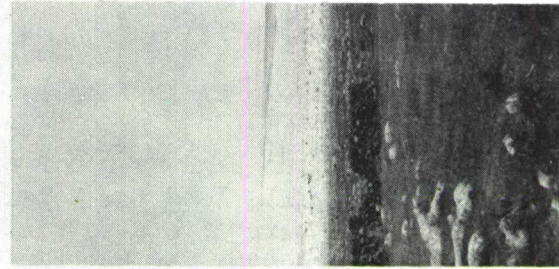
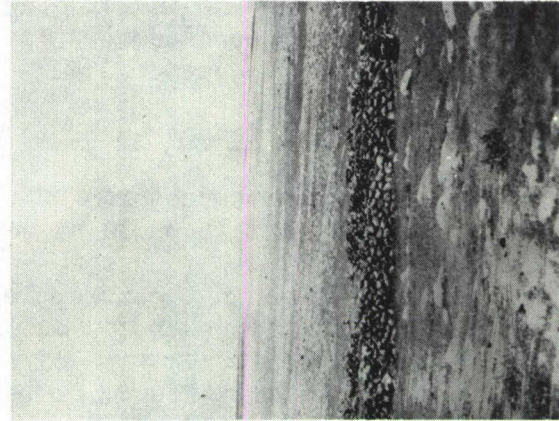
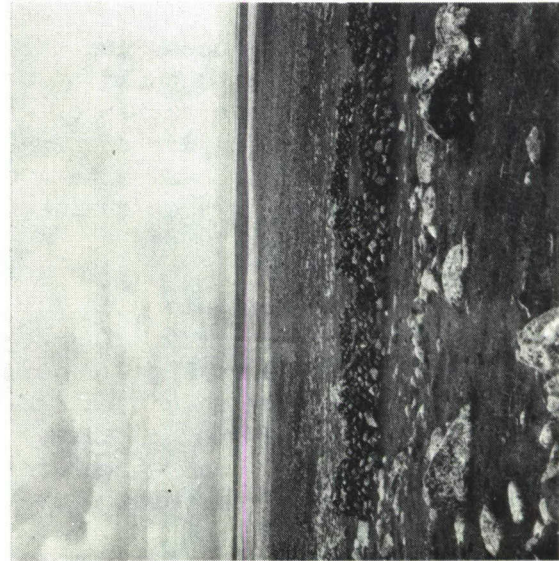
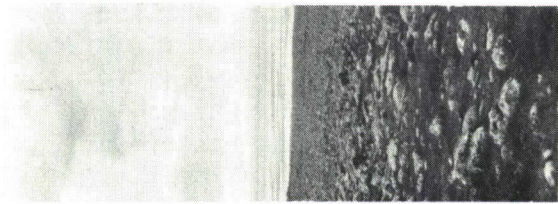
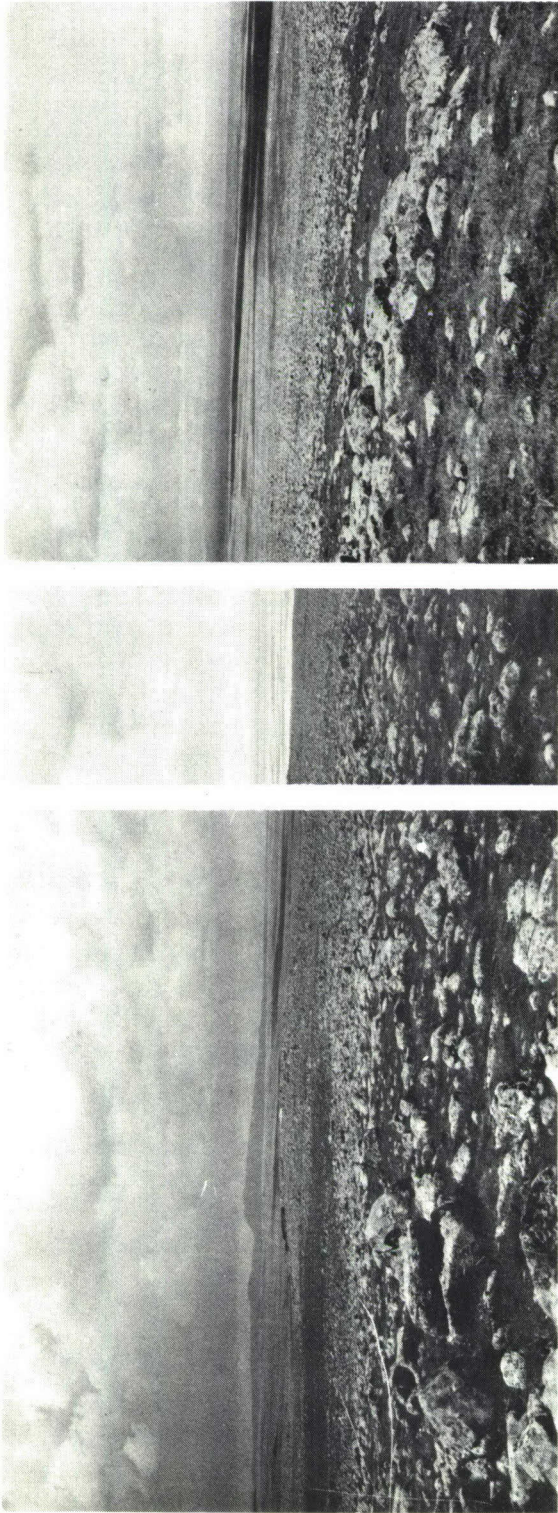


Figure 2 - Panoramic View from "Bl," one Focus of Site "B." Views made with in-and-out sun conditions. Distant storm, upper left view, precipitated hail and rain at Bl.

SECRET

Koldrum, 01 x 72.6 (M43b1), 7.2 km,
Sarikak, 97.5 x 71.2 (M43b1), 3.9 km,
Tilvaki, 97.2 x 69.2 (M43b1), 5.1 km, and
Kervanpinar, 97.3 x 66.5 (M43b1), 7.2 km.

7. Access to Area "B"

The land from Highway 6 north to the area is extremely rocky, (Figures 2 and 3). The land for potential sites for operations buildings, antenna and ground screen is also rocky but less so than the land over which an access road would be built. The present access way is nothing but a camel trail twisting and winding between rocks. This path is not "jeepable." It would be necessary to build a road over rocky terrain for an approximate distance of 5 km.

8. Site Preparation, Area "B"

Figure 2 is a succession of photographs taken from position "B₁", Figure 1, in an attempt to build up some idea of the panoramic view from this point. The pictures are copies of polaroid shots taken just before a storm which is noted in the upper left view. The panoramic view builds up from left to right in each row and from top to bottom. The eye at this point had a relatively clear view of the mountain ranges. Even though a filter was used, the pictures do not show the mountain detail visible to the eye on the day of photographing.

Figure 3 is a succession of photographs taken from position "B₂", Figure 1, in an attempt to build up a panoramic view for this position also. These pictures are copies of slide film unfortunately taken without the aid of a filter. The deficiency is in the distant view in each case where mountains, Det. 171 and site 106 were visible to the naked eye. Here again the panoramic view builds up from left to right in each row and from top to bottom.

The problem of "floating rock" has been previously discussed. The severity of this condition in area "B" is unknown. Visual inspection of the surface (reference Figs. 2 and 3) reveals considerable rocky formations, however the density shown is much less than that of the land from Highway 6 to the site "B" area. The surface area potentially available for buildings and structures is relatively flat with gentle slopes, and small sections of the area are relatively free of surface rock.

It was not feasible for the exploratory team to make field measurements of land slope for antenna elements and ground screen. However, approximate slopes were determined from map contours at several points within area "B", Figure 1. These are as follows:

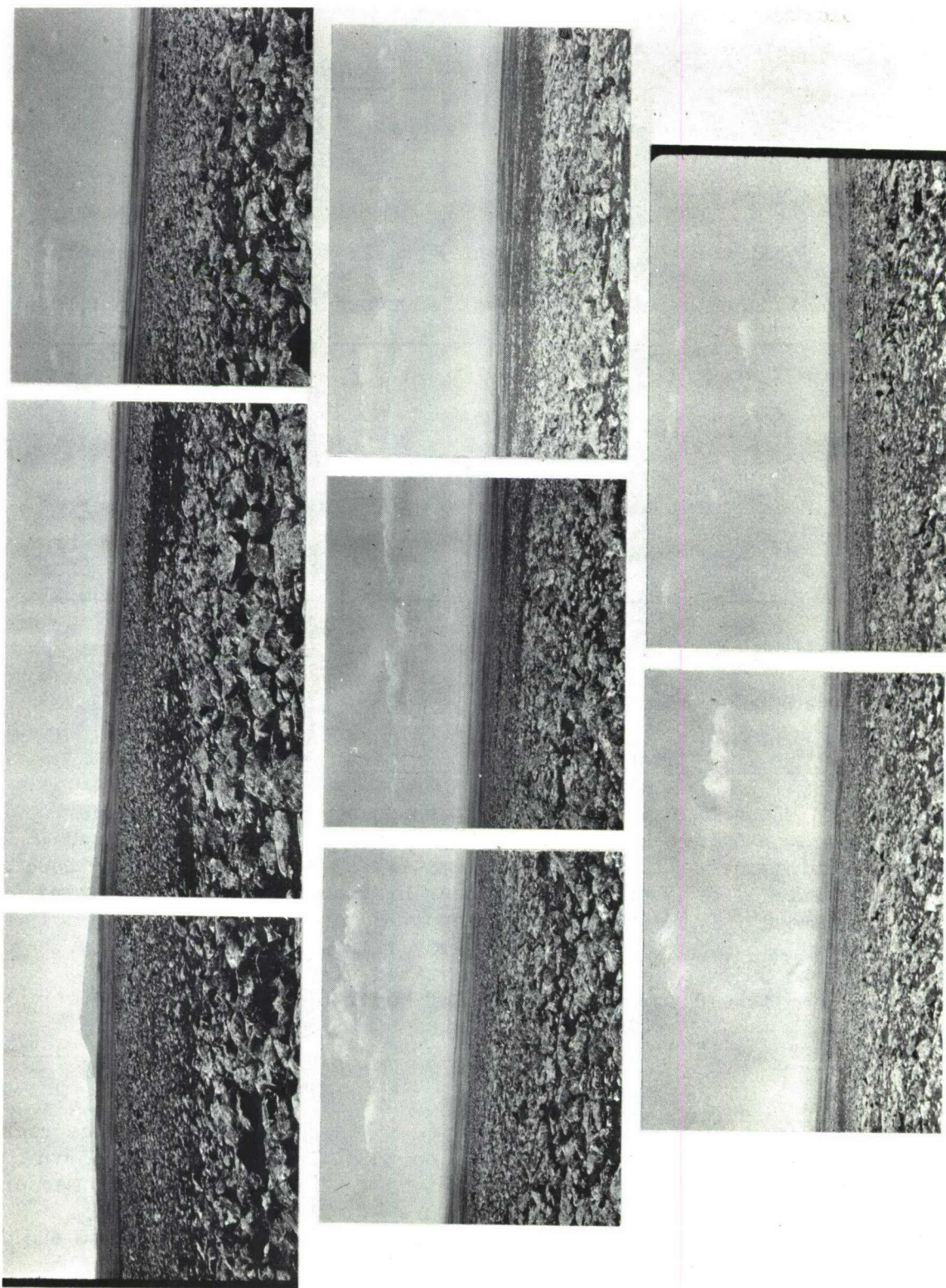


Figure 3 - Panoramic View from "B2," one Focus of Site "B"

SECRET

(a) Focal point at coordinates 93 x 72, elevation 1045 meters

Distance	Downward slope to N	Downward slope to NE	Downward slope to NW
1 km	2 ⁺⁰	1.5 ⁰	1 ⁰
2 km	--	2.0 ⁰	1 ⁰
3 km	2 ⁻⁰	2.0 ⁰	2 ⁰

(b) Focal point at coordinates 94 x 72, elevation 1008 meters

Distance	Downward slope to N	Downward slope to NE	Downward slope to NW
1 km	2 ⁻⁰	2 ⁰	1 ⁰
2 km	2 ⁻⁰	2.5 ⁰	1 ⁺⁰
3 km	2 ⁻⁰	2 ⁺⁰	2 ⁺⁰

(c) Focal point at coordinates 95 x 72, elevation 975 meters

Distance	Downward slope to N	Downward slope to NE	Downward slope to NW
1 km	2 ⁻⁰	1.2 ⁰	1.6 ⁰
2 km	2 ⁰	1.2 ⁰	1 ⁰
3 km	1.4 ⁰	2.4 ⁰	1.2 ⁰

9. Right of Way, Mineral Leases and Property Ownership

Mr. M. Ipek (Turkish civilian, perhaps equivalent to Recorder of Deeds, Province of Diyarbakir) stated that Area "B" is privately owned property, divided unequally among approximately 10 owners. Some of these owners have title also to the property near Highway 6 which is of interest for an access road. These owners were reported to live within the province of Diyarbakir. All owners have right of way rights to their property, but not the right to build a road. Mr. Ipek stated also that no mineral leases have been issued for this area as of May 1965.

(B) LAND AREA "D"

1. General Location

Area "D" lies essentially to the north of Det. 171 on the north side of hill Hamzababa T (elevation 892 meters). A rough sketch of area "D" and its environs are shown by Figure 4. The reference grid is that from Turkish Secret Map ELAZIG L44d4 and the positions of towns, etc. are shown approximately. The grid coordinates of one approximate center of an area of interest is from Turkish secret map coordinates (09.2 x 89.5)

SECRET

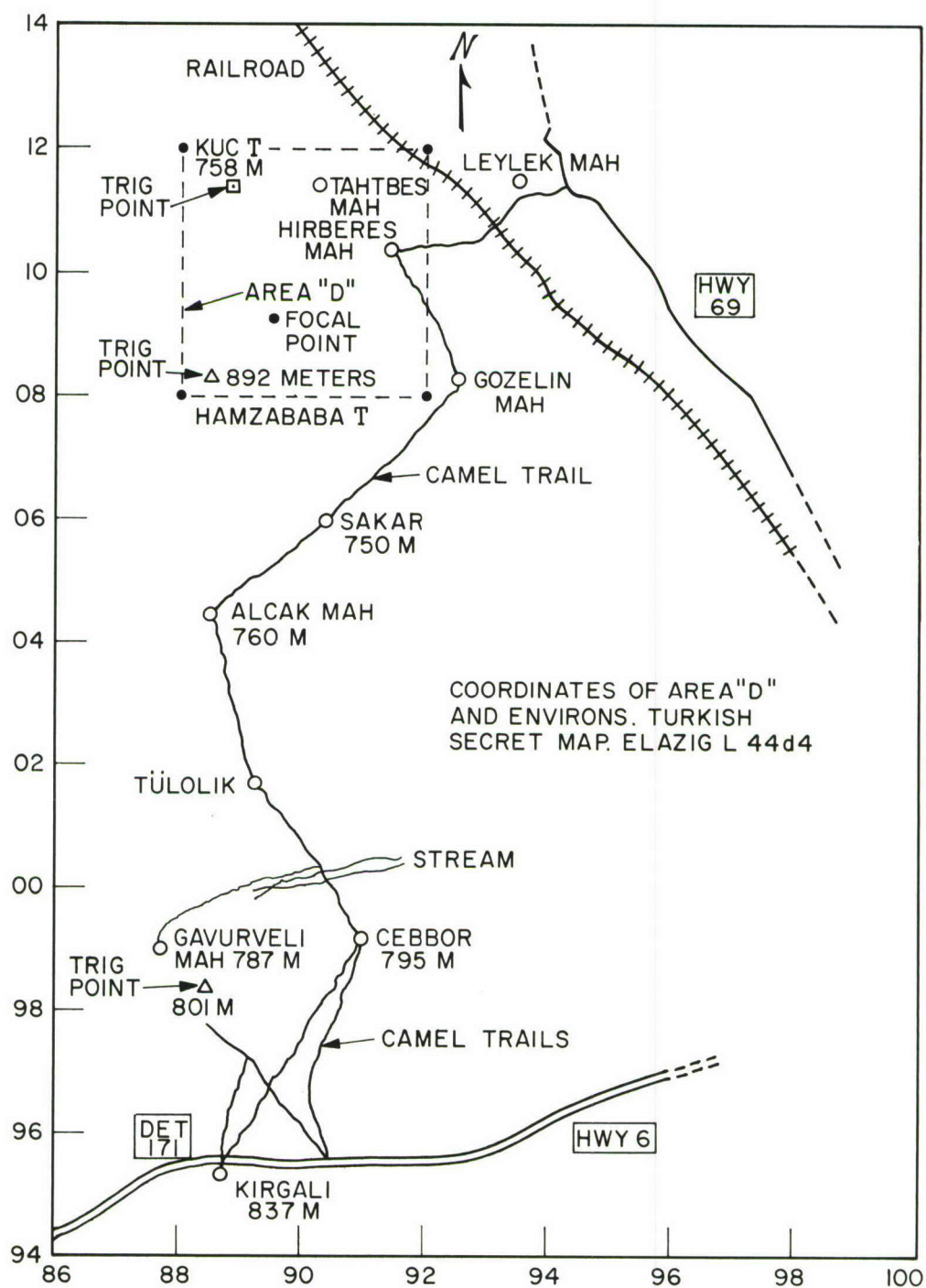


Figure 4 - Elementary Coordinate Map of Site "D" and Environs

SECRET

at elevation of 810 meters approximately. If this point were to represent the focal point of the antenna, it may be considered flexible and moved to say 08.5 x 89.5 to avoid acquisition of any village, or village property. The area "D" may be considered to be bounded by grid coordinates 08 to 12 and 88 to 92.

The coordinates of established land marks or trig points in or near the area "D" are:

- (a) Approximately 0.5 km southeast of Gavurveli, elevation of trig point is 801 meters
- (b) Peak of hill called Hamzababa T, elevation 892 meters (08.2 x 88.4)
- (c) Henzero T (08.5 x 91.5) elevation 800 meters
- (d) Kuc T (11.5 x 88.7) elevation 758 meters
- (e) Leylek T (10.8 x 93.8) elevation 743 meters
- (f) Cebbor (99.4 x 91) elevation 795 meters

2. Directions to Area "D"

At the main gate of TUSLOG, Det. 171, turn left on Highway 6 going (east) about 15 miles, turn left at intersection with Highway 69 (near Shell gas station). Proceed along Highway 69 for approximately 19 miles to a camel path southeast of Karakol. Proceed along path (jeepable) to the village of Leylek. From this point on it is necessary to proceed on foot (or by burro) to the village of Hirberes, thence up Hamzababa T to grid point (09.2 x 89.5). The best means to arrive at this grid point is by helicopter from TUSLOG, Det. 171, if such were available. This point is about 14 km from Det. 171 at a magnetic bearing of 8.90. There are other devious paths to the area. These are considered under the title Access to Site.

3. Terrain and Topography

The topography of the focal point (09.2 x 89.5) is shown by Figure 5. The terrain slopes generally to the north and it is strewn with rock and boulders. It is believed that the "floating rock" condition may exist at this area also and comments on Area "B" relating to this subject might apply.

No drainage problem appears to exist for Area "D". There was no evidence of the area being used for crop cultivation; the light grass cover between the rocks (which exists after the rainy season for a month or so) is used for light grazing purposes. Fences are nonexistent.

SECRET

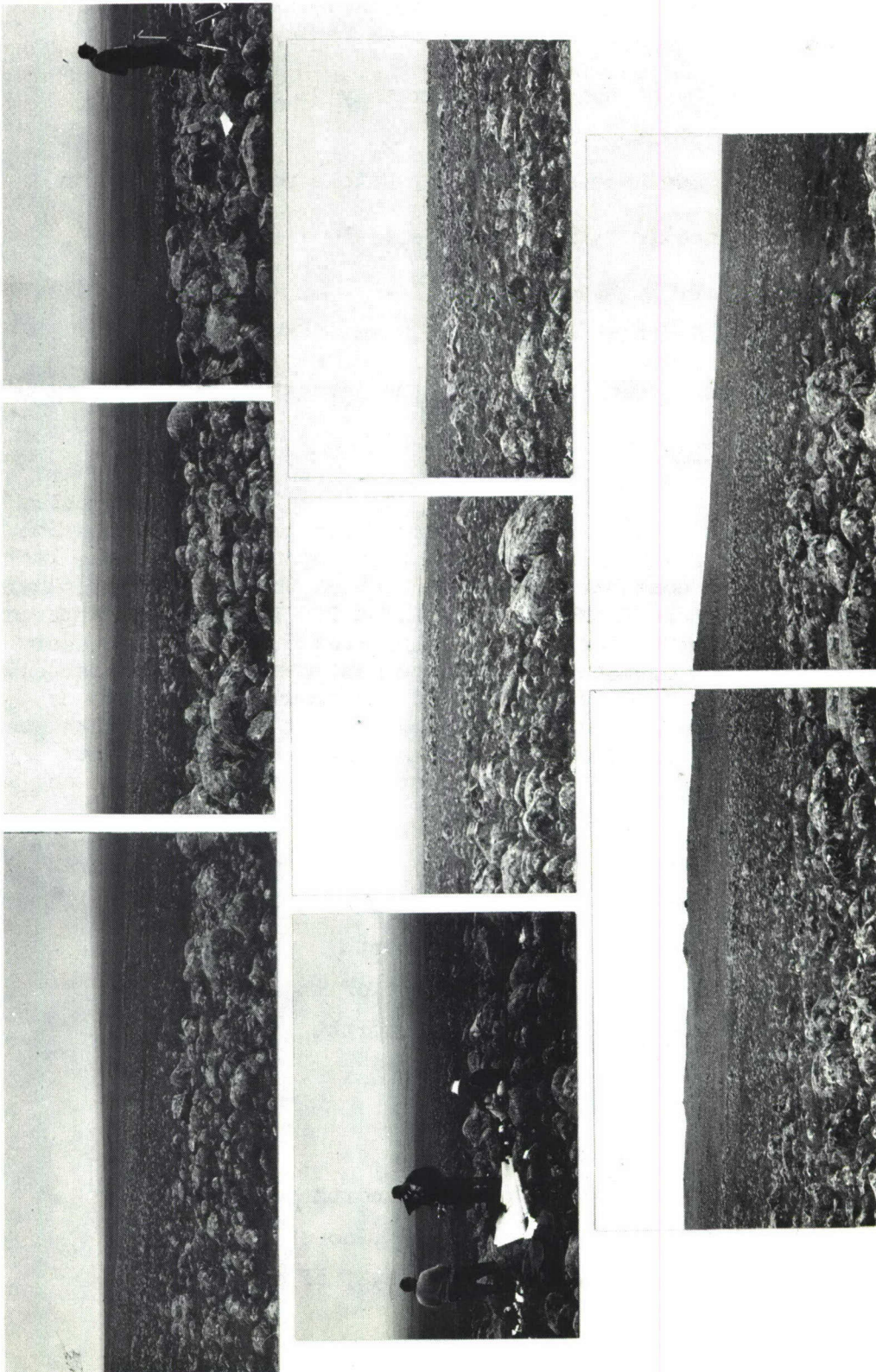


Figure 5 - Panoramic View from one Focus of Site "D"

4. Specific Distance Measurements

The distance from Det. 171 to Area "D" is

- (a) By highway - approximately 35 miles
- (b) Shortest distance 14 km
- (c) See Access Data for possible road construction

The distance from Area "D" to site 106 is

- (d) By highway - 39.7 miles
- (e) Shortest distance 15.9 km

The distance from Area "D" to the nearest highway [69] is 6.8 km.

5. Obstructions

Reference is made to Figure 5. In this figure a succession of photographs tend to show a panoramic view. The panoramic succession is from upper left to right in the row and from top to bottom. The last two photographs are somewhat immediately behind the focal point showing the top and right side of the hill Hanzababa T. There are no apparent obstructions to construction or use of the area other than necessary land preparation for operations buildings, antenna and ground screen. There is no direct line of sight path on the ground to site 106 or Det. 171 but this is not considered a problem for microwave links when one employs towers, reflectors or other means. From focal point (09.2 x 89.5) rough magnetic bearings were taken on town, hills and a derrick as follows:

Object--approximate bearing in relation to magnetic north

Turkan Village--80° west of mag. north

Little Knoll--72° west of mag. north

Oil Derrick (drill rig)--58° west of mag. north

Tahan Village--50° west of mag. north

Hill--42° west of mag. north

Geylik T--Mag. north

Tahtbes--Mag. north

Leylek Village--50° east of mag. north

Hirberes Village--55° east of mag. north

Leylek Station on Railroad--90° east of mag. north

Hill--125° east of mag. north

Hamzababa Hill (top)--150° west of mag. north

6. Nearby Villages

Native villages designated by coordinates from Turkish secret maps are considered for reference only. They are:

Tahtbes (11.5 x 90.1) 2.5 km north of possible antenna center

Hirberes (10.4 x 01.5) population 80, 2.0 km from possible antenna center

Gozelin (08.2 x 92.6) 4 km SE of possible antenna center

7. Access to Area "D"

No access road exists to Area "D", but there are alternative approaches for building an access road. One alternative is to build a 6-mile (short by comparison) access road from Highway 69 to the village of Leylek, thence to the village of Hirberes and on to the site. Assuming this road to be approximately 6 miles long, the total road distance from Det. 171 would be nearly 41 miles. This is objectionable from a logistics standpoint.

A more attractive alternative is to build a 10-mile access road to Area "D" from route 6 near Kirgali. There are also alternatives for an access road from this starting point. The possible alternatives are:

- (a) Kirgali (Hwy 6) to Cebbor, to Tulolik to Alcak Mah, to Sakar to Gozelin to Area "D".
- (b) Kirgali (Hwy 6) to Gavurveli to Tulolik, to Alcak Mah to Sakar to Gozelin to Area "D".
- (c) For the above alternatives, it is possible to go directly from Tulolik to Sakar eliminating Alcak Mah.
- (d) Kirgali to Cebbor, to Asaguleylek, to Dengluc, to Sakar to Gozelin.

The potential land for construction of an access road from Highway 69 to Area "D" is lightly covered with rock formation. However, it would be necessary to cross one stream and a railroad. The alternative approaches from Highway 6 (enumerated previously) would be politically beneficial and perhaps effective in acquiring both the Area "D" land and a right of way. Routes connecting villages from Highway 6 are thus attractive. There is a stream and lake-like formation along coordinate 00 approximately 2.5 km north of Kirgali (Hwy 6). The traverse for a road must consider this situation in assessing the alternatives mentioned.

8. Site Preparation "D"

The surface is covered with rocks and boulders and there is a possibility of the existence of the "floating rock" condition. If the

antenna and operations buildings are located well up on the Hamzababa hill, one would avoid including a village. This choice may require considerable site preparation for the operations buildings. The best situation for the antenna and operations buildings can be determined only from a detailed survey of the area.

It was not possible for the team to make field measurements of existing slopes over the land area "D". However, approximate slopes were determined from Turkish Secret Map ELAZIG L44-d4. With the focal point at grid coordinates 09.2 x 89.5, elevation 810 meters approximately, the slope at the distances noted were:

Distance	Sloping downward to N	Sloping downward to NE	Sloping downward to NW
1 km	2 ⁺⁰	1 ⁺⁰	1 ⁺⁰
2 km	1.5 ⁻⁰	2 ⁺⁰	1 ⁻⁰
3 km	flat	0.5 ⁰	---

9. Right of Way, Mineral Rights and Property Ownership

Mr. Ipek, Turkish civilian, stated that Area "D" was private property owned by two individuals who live in the vicinity of Diyarbakir. The ownership of the land for the numerous speculated rights of way (B7) was not disclosed. It was understood that no mineral right had been granted as of May 1965, but the team noted an oil drilling rig at about 10 km to the northwest. This prospecting was stated to be under Gulf Oil effort. There is the possibility that mineral rights could be a factor in the price of the land in Area "D".

SECTION II

LOGISTICS DATA

INTRODUCTION

This material, gathered by the Site Survey Team, is useful for planning, costing, subcontracting, etc., in support of the AN/FPS-95 program. The data reported also contain information in the areas of LOGISTICS AND SUPPORT, i.e., FACILITIES FOR CONSTRUCTION, TRANSPORTATION, LABOR, LIVING CONDITIONS, SECURITY, HOST COUNTRY CUSTOMS, PASSPORT AND VISA INFORMATION, etc.

(A) SUMMARY OF FINDINGS

On the assumption that the area finally selected is within approximately 15 miles from the existing supporting base, TUSLOG DET 171, the following summarizes the main results of the LOGISTICS SURVEY.

1. USAF Supply Depots

The main supply depots are the AFLC depots located in the United States; there are no local AFLC depots. The main AIR FORCE supporting Wing is located in ADANA. This supplies FOOD PROVISIONS, AFEX SUPPLIES, MILITARY TRANSPORTATION, and is the first Port of Entry for MATS CHANNEL AIRLIFT. No materials or supplies can be obtained from these overseas bases (other than TUSLOG DET 171) during the installation phase for AN/FPS-95.

2. Construction Materials Availability

None of the following construction materials or machinery is available locally:

- (a) Rope, cable, block and tackle, and chain blocks.
- (b) Electrical supplies, plumbing supplies, lumber, hardware, steel stocks (sheet or structural), aluminum, brass, copper, zinc, and lead stock (sheet or bar).
- (c) Ready-mixed concrete.
- (d) Concrete mixers, road roller.
- (e) Mechanical ditchdiggers (not suitable. Local labor and dynamite is best substitute).

The following materials are available: sand, gravel (river run), cement (substandard), tar and pitch, solvents (turpentine, kerosene, naptha, alcohol, carbon tet), oils and greases, gases (oxygen and acetylene), welding supplies, nails, reinforcing rods. The detail costs of the above

items are listed subsequently. There are no local contracting firms available except the Province (Diyarbakir) Road Department.

3. Detail Factual Data

(a) Logistics

The detail data including costs are as follows:

1. Mobil motor oil - \$0.7628 per gallon
2. Cement (dry) - 11.50 Turkish lire (T.L)
3. Picks - 10.00 T.L.
4. Spades - none available
5. Posthole diggers - none
6. Axes - 20.00 T.L.
7. Hatchets - 20.00 T.L.
8. Shovels* - 15.00 T.L.
9. Gases by the tank
 - (a) Oxygen** - 200.00 T.L.
 - (b) Acetylene** - 200.00 T.L.
 - (c) Compressed air - not available locally
10. Welding supplies
 - (a) Flux - 5.00 T.L./kilo
 - (b) Electrodes - 25 kurus per piece
 - (c) Glasses and hoods - 35.00 T.L.
11. Glass
 - (a) Glass (safety) - 150.00 T.L. per sq. meter
 - (b) Window glass - available at 60.00 T.L./sq. meter
12. Sand - 20.00 T.L. per cu. meter
13. Gravel - River run - 23.00 T.L. per cu. meter
14. Reinforcing rods - 1.80 to 2.10 T.L. depending on size
15. Lumber - 675.00 T.L. per cu. meter
16. Tie wire - 3.50 T.L. per kilo
17. Nails - 3.30 T.L. per kilo

All above can be purchased in quantity on the local civilian market.

* Local labor require local native type shovels

** Obtained from Istanbul two weeks from date of requisition

(b) Transportation

There are four means of transporting material: water, air, rail and trucking.

(1) Water. The closest port is Iskenderun on the Gulf of Iskenderun. Distance by road from the proposed site is 342 statute miles. A receiving port storage warehouse is available. The incoming loaded ship must have adequate crane capacity of its own (at least 80 ton) for off-loading at dock. There is a crane at the dock of questionable use. Ships of freighter size can be accommodated by this port.

(2) Air. Airlift will be used for hauling some material by special MATS airlift direct to the Diyarbakir military airport approximately 15 miles from the proposed site. The largest cargo aircraft that can land there is the type 133. Material handling personnel and material handling equipment must be made available by special arrangements with USAFE. Military guards can be made available also if needed. The airport is not an all-weather airport and planes can only land in daylight hours. Airport lighting aids are available. Some material will be transported through normal MATS channel lift.

(3) Rail. Material arriving by water at the port of Iskenderun may be off-loaded and transported to the site by rail. The distance from the port to Diyarbakir Station via Elazig is 390 miles. The tracks are standard gauge but the rolling stock is old. Normal transit time is 3 days to two weeks. The minimum weight load is 7½ U.S. tons. The rate from the port to the site is 98.20 T.L. per U.S. ton. There is a minimum of 10 T.L. ordering charge. The antiquated rail cars have 20-ton maximum capacity, but 50-ton cars are obtained from Istanbul in a period of 2 weeks. Maximum width of any load is 8'10"; maximum height above bed of car is 11'6".

(4) Trucking. The material off-loaded at the port can be routed by truck traveling from Iskenderun to Diyarbakir over first class and second class roads. The route is from Iskenderun, Kirikhan, Islaniyo, Gaziantep, Urfa, Siverek, to Diyarbakir. The distance is 342 miles.

All bridges are modern. The maximum gross bridge carrying weight is under 50 tons. There is one tunnel with an overhead clearance of 15 feet 7 inches; horizontal clearance for 14 ft. wide container. Trucks travel for 2 days (transit time 36 hrs.) with an overnight stay at Urfa. The trucks use a parking area at Urfa and no guards are required. (Note: the U. S. has not lost anything to date.)

The road route is open the year around and the conditions are generally good. Both first and second class types of roads are in that route. The major portion is first class; a small portion is second class. (This latter type was originally a first class road, but due to lack of

SECRET

maintenance, it is now a second class road.) The minimum weight is 3 tons. The rate from the port to the site is 188.10 T.L. per U.S. ton. It is reported that Lowboys are available from AIKAC of Adana and Tuzcuoglu of Ankara.

(c) Contractors. The following contractors were noted as active in Turkey:

1. Morris and Knudsen
PK-0 NECIDIYEKOY
Istanbul, Turkey
2. Reynolds Construction Co.
ABDULHAKHAMIT
Caddesi 3/c, Turkey
3. Altin Dept 8
KAT 5.6
Istanbul, Turkey
4. Paul Hardeman, California
5. Burns & Roe
Turk-Inter-Makineleri A-5
Attaturk, Boulevard 125/10
Ankara, Turkey
6. Mid-East Division of Tumpane Co.

(d) Local Labor Costs. Local labor in various skills is available. Rates in Kurus per hour are as follows:

Unskilled	150
Truck Drivers	300
Machinists	450
Warehouseman	260
Stockroom Men	260
General Repair Men	250
Janitors	200
Clerical Help	500 Start
Electricians	340
Riggers	450
Welders	450
Diesel Mechanics	400 up
Crane Operators	400
Cooks	140; with fringe benefits, 200
Cooks Helpers	140

(e) Living Conditions. (S) During construction and installation of AN/FPS-95, the personnel will be housed and fed at the supporting base, TUSLOG DET 171. No families will be permitted to be housed in the area, either on or off site. Personnel will commute daily to the proposed site.

There is a well equipped medical dispensary available at TUSLOG DET 171 but no resident doctor at present. In case of serious accidents or illness, patients are now flown for treatment elsewhere (Adana, Ankara).

Recreation facilities are available at the supporting base. These are: library, bowling alley, recreation workshop, gymnasium, swimming pool, skeet range, softball diamond, radio station, and movie theatre. A Base Exchange, Post Office and Chapel are also available as community facilities.

(f) Communications. Military Communications Channels are available. APO service is available for transmission of classified and unclassified documents.

During installation phase, a Microwave communications link is recommended between the new site and TUSLOG DET 171. Wire or cable links between the sites are not recommended because they are removed by "copper" collectors.

(g) Environmental Data

Rainy Season - November to May (gumbo mud conditions at times)

Wind - Up to 50 knots (April 1964)

Temperature - Winter low 5°F

Winter normal 20°F (1964)

Summer 130°F

For additional details, reference is made to Section IV and Reference 1.

(h) Mechanical and Construction Equipment. Det. 171 has a limited amount of construction equipment and tools, all of which are required for their own day-to-day operation and these cannot be issued on a loan basis for any period of time, such as 2 weeks or more. Det. 171 also has a carpenter shop, sheet metal shop, and small machine shop, but these work areas have limited equipment and cannot support construction contractors.

Det. 171 has the following mechanical equipment:

One Type D-6 bulldozer is available.

Mobile crane

Portable power plant; 60 - 100 kw

Stake trucks - 4 each, 1½ ton

Tractor trailer - 2 each (40 ft.)

It is reported that the only rental equipment available from the Turks, locally, is trucks up to 10-ton capacity.

(i) Water. Water for the construction crews will be made available by portable tanks hauled from the supporting site. The local water has a high calcium content and is treated and purified for potability. During the rainy season (from November to May) nearby streams may be intermittent sources of construction water, but native use of such water cannot be impaired thereby.

(j) Security.

(1) A thorough security check is made of local labor who might be used by the contractor. The security levels are confidential and secret. The procedure is as follows:

(a) A check is made with local police and home town, then Hq TUSLOG and finally the Turkish General Staff. A temporary clearance is issued immediately following the local police check. Final clearance, which takes from 3 to 12 months, is issued by the T.G.S. following a thorough detailed check.

(2) Turkish clearances have been very effective in the past.

(3) In order for the contractor and his own personnel to enter the main base, he is checked at the main gate, identified, and issued a temporary pass. To work in the area of the new installation within the compound, the contractor personnel need secret clearances. Discussion with the Base Commander on any and all aspects of the new installation or anything relating to it, when information about existing operation needs to be discussed, requires a secret clearance. To work in the new operational building, once installation has begun of classified equipment, requires secret clearance.

(4) During the installation phase, the Base Commander will arrange for storing the contractor's documents when not being used.

(5) During the installation phase, the Base Commander cannot furnish guards at the new operations building on a 24-hour basis.

(6) Arrangements for guarding the perimeter of the site on a 24-hour basis need to be discussed with USAFE and JUSMATT.

(k) Banking.

(1) No banking facilities are available on the base which can be used by the contractor's personnel. Personal checks can be cashed at the AFEX and Officers' Club.

(2) Local civilian banking facilities are available.

(a) Savings accounts render 3 $\frac{1}{2}$ % interest

(b) Checking accounts:

Monthly maintenance charge - Yes

Minimum balance requirements - None

Account statements are issued monthly but frequent follow-up requests must be made.

(c) Safety deposit boxes - None

(d) Certified checks can be issued and are accepted in other neighboring countries.

(3) Civilian banks will accept pay checks of contractor's personnel issued against funds deposited in a local bank by the contractor.

(4) Payroll check writing and accounting services by civilian banks are not available.

(5) There are no known Air Force regulations which prohibit civilian banks from handling U. S. contractor's accounts thereby gaining detailed knowledge of the size of a construction program. For security reasons in the past contractors have deposited funds in several banks.

(6) Present official "stable" currency exchange rate is 9 T.L. to 1 U. S. dollar.

(7) Normal banking hours are 9 to 3. Banks are closed on Sunday and after 1 PM Saturdays. There are also many "national" holidays on which banks are closed.

(1) Lodging & Subsistence.

(1) Subsistence

<u>Station on base</u>	<u>Breakfast</u>	<u>Dinner</u>	<u>Supper</u>
Airmen	\$.23	\$.50	\$.40
Civ & Officers	\$.40	\$.65	\$.65
Others on per diem rate	\$.40	\$1.00	\$.90

(2) <u>Lodging on base</u>	\$3.00 room/man/month (2 men in room)
Officers & Civ	\$2.00/mo/man (to be increased to \$5.00 man/mo (1 man in room)
Per diem rate	\$1.50/day/man (TDY rate)

(m) Civil Engineering Information Brochure. Reference is made to the USAF publication entitled "Civil Engineering Information Brochure" dated January 1965, on some features of the Diyarbakir Air Station (USAFE & CLAS) Diyarbakir, Turkey, Reference 3. This publication can be obtained from the Air Force.

(n) Passports and Visas. Travel is permitted anywhere within the country (except Turkish military bases) on a United States passport. An American citizen can remain in the country for 90 days on his U.S. passport. For a longer stay, a residence permit is required which is good for one year. This must be obtained from HQ JUSMMAT or TUSLOG DET 30 (Customs Liaison).

The procedure is to first obtain a visa, then application is made for the residence permit. It is recommended by the U. S. Embassy that the visa be obtained outside the country. The costs for the residence permit are: 6 months, 25 T.L.; 1 year, 50 T.L.; 2 years, 75 T.L.

If a passport or visa is lost, it must be reported immediately to the U. S. Embassy. A police report must be filed at the place of loss. A replacement passport can be issued by the U. S. Embassy; the requester must have a certified copy of his birth certificate.

An American citizen cannot leave the country without a passport. It takes about 4 days to get a new replacement passport issued. Application is made to the U. S. Embassy. Official passports are issued by the Department of State, Washington, D. C.

The American Embassy, Ankara, Turkey, issues a brochure (Reference 2, the latest is 39 pages) covering Turkish-American relations, Turkish history, U. S. Government Activities in Turkey, U. S. Economic Aid to Turkey, U. S. Military Aid to Turkey, USIA Service in Turkey, and General Information to Visitors. It is recommended that the latest issue of this publication be obtained from the Ambassador to Turkey or the State Department.

(O) Personnel Conduct. American contractor personnel are subject to the same local and province laws as the Turkish civilian population. The host country has shown leniency to military personnel in the past. Relationships are not bad.

In case of an automobile accident with a civilian, the driver is automatically guilty. This is the reverse of U. S. justice. As a consequence, Turkish drivers are used almost exclusively.

While on Det. 171 or associated bases, the contractor's personnel are subject to military regulations.

There is no need for contractor personnel to register with local police or others when they first enter the locale.

With respect to fraternization, local customs, etc., flag, religion and customs must be rigorously observed.

SECTION III

RADIO COMMUNICATIONS, RADAR AND RADIO INTERFERENCE DATA ON TUSLOG 171

INTRODUCTION

The following material is of value in the determination of the final siting of AN/FPS-95. In particular the HF activity at sites 105 and 106 is of utmost mutual importance to the positioning of AN/FPS-95.

(A) SOURCES OF INFORMATION

The subject information was obtained from CAPT C. Sorenson USAF, LT Tucker USAF, SGT Phillips USAF, and others at TUSLOG-171. MAJ Reed, USAF at EAME (Germany), provided some frequency information.

(B) GENERAL INFORMATION

1. There are electric arc welders and heliarc welders available at TUSLOG 171. When these equipments are in use some RFI is experienced on AN/FPS-17 and AN/FPS-99.

2. The main power plant at TUSLOG 171 consists of a battery of six (projected 8) 1250 KVA, 60 cycle generators driven by diesel engines. There are no complaints of a radio frequency interference nature from this complex.

Communications site 105 and 106 are not powered from the main base. These sites have their own portable 60-cycle power supply from which no RFI is experienced.

3. The TUSLOG 171 establishment employs a mixture of incandescent and fluorescent lighting. Judicious use of fluorescent lighting should preclude any interference difficulties from this known source of RFI.

4. None of the government vehicles or construction equipments are equipped with ignition noise suppression to reduce RFI. Some private vehicles may be so equipped, but only in a marginal manner, i.e., resistance-type spark plugs or resistance-type high voltage ignition cables and condenser-treated breaker points.

5. There are no television receivers at TUSLOG 171. There are, however, numerous personal all-wave broadcast-type receivers of various degrees of circuit complexity. These radio receivers are not considered a serious source of RFI though they are known sources of "birdies." The quality of reception on these receivers may be impaired by the radar and radio communications equipments.

6. The TUSLOG 171 medical facility has dental, x-ray and H.F. diathermy equipments, the operation of which could cause RFI, though if properly housed and shielded, this source could be subdued.

7. It is known that the various electronic complexes at TUSLOG 171 contain both vacuum tube and solid state active elements.

(C) SPECIFIC INFORMATION

1. Communications Data

(a) Deactivated Frequency Listing. The frequency listing for two-way transmission and reception between TUSLOG 171 and Incerlik (Turkey) and Karamursel (Turkey), as issued to the Survey Team by EAME (Major Reed), was that provided the Security Service, since deactivated. These frequencies, in kilocycles, are: 2085, 3379, 4825, 6888, 9394, 3250, 4012.5, 4025, 5325, 7885 and 10174, 2370, 3207, 3255, 5127.5, 6781, 7681, 3360, 3972.5, 4056.6, 5475, 7890 and 10510.

(b) "Twilight" Frequency Listing. The HF "twilight" circuit operating frequencies obtained from EAME (Major Reed) are not active at TUSLOG 171. These frequencies are, however, active at IZMIR which is connected to TUSLOG 171 by the Tropo network. These active frequencies, in kilocycles, are: 6820.5, 7305, 7425.5, 9415.5, 10140.5, 11100, 11642.5, 13479, 13545, 14374, 14505, 14683.5, 15476, 15560 and 18180.5.

(c) Site 105. Communications Site 105, located adjacent to TUSLOG 171 and a part thereof, is the HF communications receiving facility and oblique ionosphere sounding receiving facility between TUSLOG 171 and England (Croughton-Barford, St. John). This site is also the location of the Mark 98 (30' dishes) tropo transmission and reception equipment which constitutes the only- though temporary-link to Malatya and thereby to the rest of the far-reaching Tropo communications network.

(1) The Tropo equipment operates on 857.0399 Mc transmit with a power of 10 kw; it receives on 908.87793 Mc. The emission is F9. It is reported that the IF frequency of this equipment is between 70 and 90 Mc. It was also reported that this Mark 98 equipment experiences some RFI when the AN/FPS-79 beams at its boresite tower (which is located near site 105) or for other purposes.

(2) This site has two high-band and two low-band rhombic antennas for reception of transmissions from Barford-St. John, England. This receiving function is a permanent one, and the receive frequencies and associated data are listed as follows:

RECEIVE FREQUENCIES

<u>Auth Freq</u>	<u>CXR Freq</u>	<u>Desig</u>	<u>EMSN</u>	<u>Source Power</u>
5031.5	5031.5	DDG	6A9B	39KW
5069	5069	DFA	6A9B	4KW
5243	5243	DMG	6A9B	30KW
7565.5	7564	FFM	9A9B	4KW
7832.5	7832.5	FRP	6A9B	4KW
9486.5	9486.5	HEH	6A9B	10KW
10312.5	10312	HVX	6A9B	4KW
11555	11555	JFN	6A9B	10KW
11596	11596	JGQ	6A9B	4KW
14825	14824	LGD	9A9B	4KW
15468.5	15467	LLI	9A9B	10KW
16297.5	16297	MNY	6A9B	4KW
16273.5	16272	NMK	9A9B	10KW
17503	17503	NAA	6A9B	30KW
17671	17671	NFI	6A9B	4KW
20109	20109	OLW	6A9B	10KW
23385	23385	PSF	6A9B	30KW
26471	26471	QKY	12A9B	30KW

(3) The HF receiving equipment at this Site is manufactured by Collins Radio, and is their type URG. These receivers function in single, double or triple conversion depending upon the desired input frequency setting. These receivers are well engineered and the specifics are best obtained from the manufacturer's instruction books. It was reported by the operators of Site 105 that they experience no RFI from the HF Communications Transmitting Site 106, distant about six miles to the west.

(4) The HF "backscatter" oblique sounding signals received at this site from the bearing of Croughton, England, are picked up on a vertically polarized log periodic antenna. The signals originate from the Communications Site 106, being sent out on bearing 309°41' and bounce-returned as backscatter. The technical details of the oblique sounder receiver are that of the Path Sounder, manufactured by Granger Associates, Palo Alto, California.

NOTE (1) The proposed active bearings for AN/FPS-95 are from 290° through zero to 70°. It is noted that the above bearing 309°41' is within the bearing range. Even though rhombics are notorious for

high angles of fire, and the separation of this site from one proposed site for AN/FPS-95 (roughly northwest of 105) is approximately 12 miles, it cannot be guaranteed that AN/FPS-95, so located would not receive the communications frequencies beamed "over the head" of the site. Also it cannot be guaranteed that the HF receiving site (105) would not hear AN/FPS-95 on side or back lobes. The minimizing features are that AN/FPS-95 employs a 5 kc bandwidth, does not employ conventional HF pulser techniques and its back lobes and some of its side lobes will be high angle of fire due to the presence of poor ground conditions.

(d) Site 106. Communications Site 106, distant six miles west of TUSLOG 171 main base, is the HF transmitting and oblique sounding transmitting facility. It is also one terminal of the intrasite microwave link as well as the proposed Tropo transmitting and receiving station.

(1) Tropo Equipment - The proposed Tropo equipment (AN/TRC-100) is planned to radiate and receive on bearing 286°27'50". This equipment has a slipped schedule and may not be in operation for perhaps two years.

(2) HF Antennas - This site has two high-band and two low-band rhombic (transmit only) antennas on AZ bearing 309°41' to England. It also contains the vertically polarized, log periodic, oblique sounding (transmit only) antenna also on AZ bearing 309°41'.

(3) HF Power Output and Frequencies - The HF transmitting equipment generally runs up to 40KW. The operating frequencies and associated data are listed as follows:

HF SSB DIYARBAKIR-CROUGHTON
TRANSMIT FREQUENCIES

<u>Auth Freq</u>	<u>CXR Freq</u>	<u>Desig</u>	<u>EM3N</u>	<u>Power</u>
4845.5	4845.5	CSS	6A9B	4KW
5224	5224	DLI	6A9B	10KW
7342.5	7342.5	ERU	6A9B	10KW
7714	7714	FMP	6A9B	30KW
7858	7858	FSO	6A9B	4KW
9897.5	9896	HJG	9A9B	10KW
11611	11611	JGY	6A9B	4KW
13430.5	13429	KCM	9A9B	4KW
14756	14756	LEM	6A9B	30KW
15508.5	15507	LNB	6A9B	10KW
16272	16272	MNI	6A9B	10KW
17671	17671	NFI	6A9B	4KW
20220	20220	OPA	6A9B	10KW
21825.5	21825	PJR	6A9B	10KW
26195	26195	QKS	12A9B	30KW

(4) Microwave Equipment - Microwave intersite communications with TUSLOG 171 is provided by one watt (emission F9) units operating on 8155 Mc for transmission and 8345 Mc for reception.

(e) TUSLOG 171. TUSLOG 171 is the main support base for sites 105 and 106.

(1) Microwave Equipment - Microwave intersite communications with Site 106 is provided by one watt, emission F9, units operating on 8155 Mc for transmission and 8345 Mc for reception.

(2) AFTAC Survey - This base recently supported a study team of AFTAC which is interested in a passive activity at this station operating in the 16 to 26 kc range. The proposed equipment employs loop and vertical antennas to provide cardioid df facilities. The signal observation is on phase and phase shift of base frequency. The receiving equipment preamplifier bandwidth is 500 cycles and the i-f bandwidth 50 cycles. The equipment installation is projected at this station for the first quarter FY '67 if the results of the preliminary survey justify the move.

NOTE (2) The proposed active bearings for AN/FPS-95 are from 290° through zero to 70° . It is noted that the above bearings $309^{\circ}41'$ and $286^{\circ}27'50''$ are within this range. If the Tropo equipment is properly engineered, there should be no interference (mutual) between AN/FPS-95 and the Tropo equipment. On the other hand, even though rhombics are notorious for high angles of fire, and the possible separation distance is about 6.5 nautical miles, it cannot be guaranteed that AN/FPS-95 on reception will not hear the AF communications transmitters at Site 106 through side and back lobe pickup. The minimizing feature is that AN/FPS-95's back lobes and some of its side lobes will be high angle of fire due to poor ground conditions.

2. Radar Data

(a) TUSLOG 171 houses, among other facilities, two high powered radars, one, the AN/FPS-17, the other AN/FPS-79.

(1) AN/FPS-17 - The AN/FPS-17 equipment is a pulse doppler, fixed beam radar.

a. AN/FPS-17 operates on sixteen channels in the band 188.7 to 192.9 Mc.

b. The pulse repetition rate is 30, the pulse length 2000 microseconds and the peak power is 1.2 megawatts.

c. The antenna structure is a group of clustered horn-fed reflectors with both vertical and horizontal polarization. The radiators provide horizontal and vertical fan coverages. The horizontal fan coverage is between bearings 20° and 40° ; the vertical fan coverage is on approximately 48° bearing.

d. Part of the receiver processing is accomplished at the transmitter site. The important IF frequency is 2 Mc. From this site signal information is cabled in digital form to the AN/FPS-79 radar site which houses the final signal processing equipment for both radars. A 1 Mc timing signal is separately cabled to the AN/FPS-79 area for purposes of synchronization of the radars.

(2) AN/FPS-79 - The AN/FPS-79 is a hemispheric - all azimuth coverage pulse doppler radar.

- a. The antenna is an 84 foot dish, horn fed with both vertical and horizontal polarization.
- b. The operating frequency is 432 Mc and the pulse repetition rate is 30 pps (synchronized with that of the AN/FPS-17). The pulse length is 2 milliseconds.
- c. This radar operates at 5 megawatts peak power.
- d. The received signal processing, unlike the AN/FPS-17, is all accomplished at one location. The important primary IF frequencies are 54 Mc and 2 Mc; secondary IF frequencies are 1 and 5 Mc.

3. Broadcasting Data

(a) TUSLOG 171 is completing the erection of an antenna and some new console equipment preparatory to going on the air with 50 watts power on a frequency of 1570 kc. "Radio Diyarbakir" will be a military affiliated station.

SECTION IV

WEATHER-MAPS AND MISCELLANEOUS DATA

INTRODUCTION

Reference two (2), a publication of the U. S. Embassy, Ankara, contains a number of general physical characteristics of the country as a whole. That which follows is a listing of maps applicable to the land area problem of AN/FPS-95 as well as weather data and information from other sources.

(A) MAPS

One group of maps, (Edition 1-AMS), was prepared by the Army Map Service (AMRY), Corp of Engineers, U. S. Army, Washington, D.C. These were compiled in 1951 by photogrammetric (multiplex) methods and from the then latest available medium scale Turkish source maps. The scale of these maps is 1:250,000 and each one designates the areas of reliability into Good, Fair and Photography. Of this series maps NJ 37-11 DIYARBAKIR and NJ 37-7 ELAZIG - (obtainable in the U.S.A.) are pertinent to the AN/FPS-95 land area problem. The survey team noted that the spelling of certain towns on these maps was different from the best maps available and that the location of some towns or villages was not necessarily accurate. There was much to be desired also in the accuracy of contours, position of hills, etc.

A second group of maps was available to the Survey Team only in Turkey and for use only in Turkey. These maps were to a scale of 1:25,000 and were declared to be very accurate. These maps were obtained from the Turkish General Staff, Ankara. It is believed that the location of towns, villages, hills, etc., are quite accurate. The contours are heavy lines at 50 meter elevation intervals, light solid lines at 10 meter intervals and, where necessary, dotted lines show 5 meter intervals.

The maps of this series which take in Sites "B" and "D" and surrounding areas are:

<u>TITLE</u>	<u>NUMBER</u>
DIYARBAKIR	M43 a2, 1961
DIYARBAKIR	M43 a3, 1961
DIYARBAKIR	M43 b1, 1961
DIYARBAKIR	M43 b2, 1962
DIYARBAKIR	M43 b3, 1962
ELAZIG	M43 b4, 1961
ELAZIG	I43 c3, 1962
ELAZIG	I43 c4, 1961
ELAZIG	L43 d3, 1961
ELAZIG	L44 d4,

Of this group Diyarbakir M43 b1 relates immediately to Site "B".

The maps of the above series applicable to the general area of Site "D" are:

<u>TITLE</u>	<u>NUMBER</u>
ELAZIG	L44 d4
ELAZIG	L44 c3
ELAZIG	L43 d3

and L44 d4 is the specific map including the Area "D".

(B) 486L SITE SURVEY WEATHER SUMMARY

Table 1 represents weather data averaged from 1931 to 1960 at the recording station, Diyarbakir, Turkey at elevation 677M and distant 40 KM from Det. 171. (See Reference 1, also).

Figure 6 is a plot of wind speed data for Diyarbakir, Turkey obtained from USAF's AB Survey. It is noted that the wind exceeds 25 knots a very small percentage of the time.

(C) FROST LINE

The survey team was informed that the frost penetration is approximately 3 to 4 feet deep.

(D) DUST STORMS

No general dust storms have been noted for the area. Small whirlwinds, approximately 2 meters in diameter, may kick up local columns of dust, but no special dust filters are required for internal combustion engines or human use.

(E) ADDITIONAL INFORMATION

Other data of the titled nature, including earthquake occurrences (zone 2) are to be found in NRL Memo Report 1527, dated 15 April 1964, Reference one (1).

(F) CIVILIAN AIR TRAVEL

Air travel between Turkish cities is exclusively under the control of Turkish Airlines (Turk Hava Yollari); however, there are trivial exceptions. For example, one may board PANAM at Ankara and land at Istanbul just so long as this is a rest stop of a continuing flight and not flight termination for the passenger. The Survey Team noted that Turkish Airlines used very acceptable equipment, but the service could have been improved. In a flight from Frankfurt to Ankara there was a delay at Istanbul because the immediate Turkish Airlines flight to Ankara was at capacity. It was also difficult to get accommodations for Diyarbakir. The team experienced a delay of several days at Ankara before it could book passage, and then it was necessary to show up at the airport without prior confirmation of flight accommodations.

A summarized table of weather data taken from a 486L site survey in July 1963 - page 12 follows:
(DATA AVERAGED 1931 - 1960) Location of recording station - Diyarbakir, Turkey (37°55'N-40°12'E)

Recording Site Elev - 677M

Distance to Det. 171 - 40 Km

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Rainfall (mm)	79	65	63	73	42	8	1	0.5	3	29	58	68
Snow Fall (cm)	40	34	25	0	0	0	0	0	0	0	0	0
Humidity (May/Sep - 35 Mean (Oct/Apr - 70))	77	72	65	61	55	34	25	25	28	45	66	76
Temperature °C Max 46.2	MAX 16.9	21.1	16.0	33.0	39.8	41.8	46.2	45.9	40.9	35.4	28.4	18.4
May/Sep - 24.2 Oct/Apr - 6.9	MIN -24.2	-19.0	-12.2	-6.1	+0.8	+3.5	+9.9	-11.4	-7.5	-1.8	-12.9	-17.7
Wind Velocity	M/Sec 22	MAX 34	22	22	24	18	19	20	17	21	16	20
Dir	N	S	NW	WNW	SW	SSW	NW	WSW	NW	NW	NNW	N

TABLE 1

SECRET

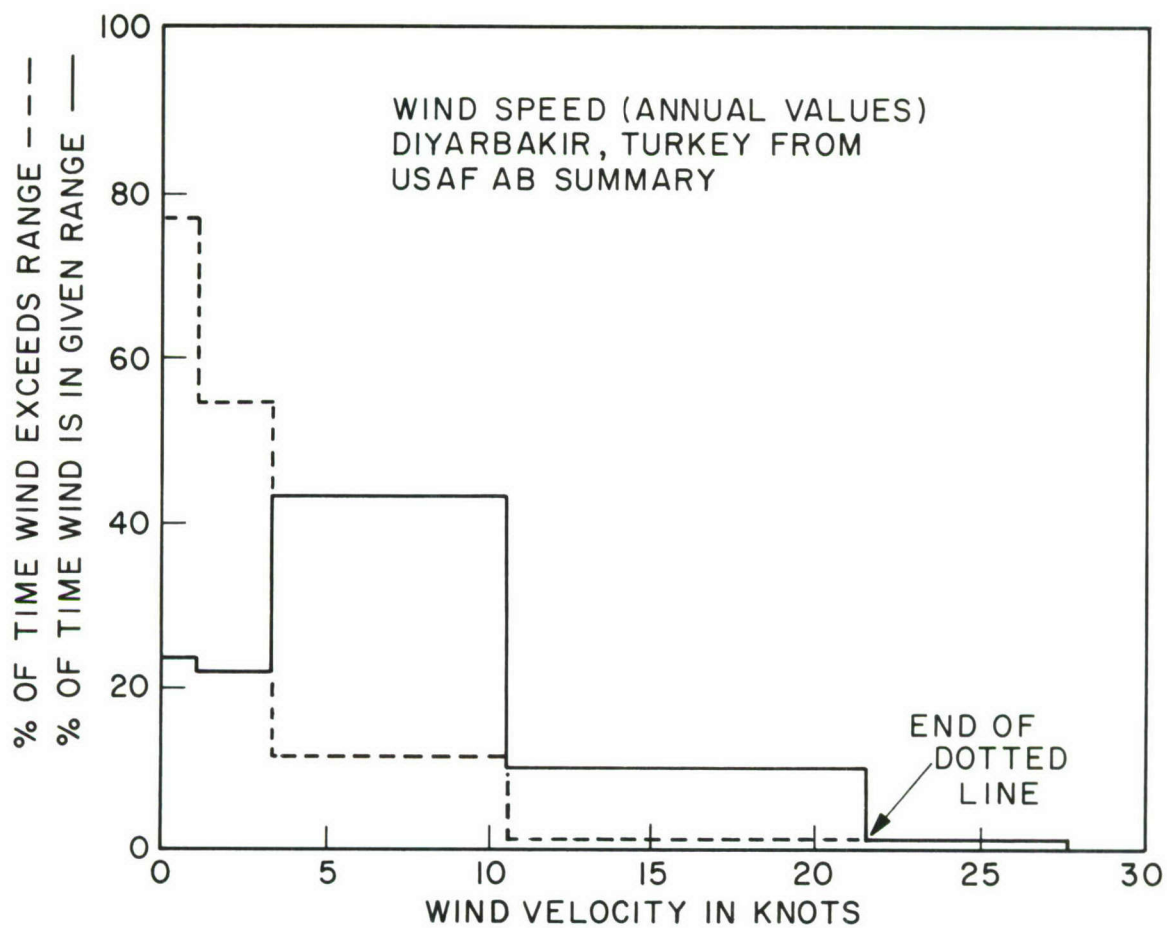


Figure 6 - Wind Speed, Diyarbakir, Turkey

REFERENCES

1. NRL Memo Report 1527
2. American Embassy Publication, (Ankara no date) of 38 pages.

This document covers the subjects of Turkish-American Relations; information on the history, physical characteristics, political situation and economic situation of and in Turkey; U. S. Government activities in Turkey, Diplomatic Offices, USIS, JUSMMAT, AID and TUSLOG; U. S. Economic Aid Program in Turkey, U. S. Military and Program in Turkey, U. S. Information Service Program in Turkey and Information for Visitors Including Exchange Regulations, Travel, Points of Interest in Ankara, Sight Seeing, Tourist Offices, Hotels, Tipping, Food, Restaurants, Night Clubs, Good Buys, Rules of Health, Medical Facilities, Doctor and Dentist, Useful Phone Numbers, etc.

3. Civil Engineering Basic Data Brochure, (USAF), July 1964, Diyarbakir Air Station, (USAFE & CLAS) Diyarbakir, Turkey. (8 pages) includes description of base facilities.